Form PTO-1390 (REV 10-94) U.S.DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEYS DOCKET NUMBER: 19075.0

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

U.S.APPLICATION NO. 10/031699

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/DE00/02191	June 29, 2000	July 29, 1999

TITLE OF INVENTION: USE OF ADHESIVE TAPE FOR HANDLING, TRANSPORTING AND STORING CAPILLARIES AND DISPENSER FOR INDIVIDUAL CAPILLARIES ON THAT ADHESIVE TAPE

APPLICANT(S) FOR DO/EO/US

BIGUS, Hans-Jürgen et al.

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. _X_ This is a FIRST submission of items concerning a filing under 35 U.S.C. 371
2. ___ This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371
3. ___ This is an express request to begin national examination procedures (35 U.S.C. 371(f) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(I)
4. _X_ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.

5. _X_ A copy of the International Application as filed (35 U.S.C.371(c)(2)).
   a. ___ is transmitted herewith (required only if not transmitted by the International Bureau).
   b. _X_ has been transmitted by the International Bureau.
   c. ___ is not required, as the application was filed in the United States Receiving Office (RO/US)
6. _X_ A translation of the International Application into English (35 U.S.C.371(c)(2)).

7. _X_ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C.371(c)(3)).
   a. ___ are transmitted herewith (required only if not transmitted by the International Bureau).
   b. ___ have been transmitted by the International Bureau.
   c. ___ have not been made; however, the time limit for making such amendments has NOT expired.
   d. _X_ have not been made and will not be made.

8. ___ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C.371(c)(3)).

9. _X_ An oath or declaration of the inventor(s) (35 U.S.C.371(c)(4)).

10. _X_ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C.371(c)(5)).

Items 11. to 16. below concern document(s) or information included:

11. _X_ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.

12. _X_ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.

13. _X_ A FIRST preliminary amendment.
    ___ A SECOND or SUBSEQUENT preliminary amendment.

14. ___ A substitute specification.

15. ___ A change of power of attorney and/or address letter.

16. _X_ Other items or information:

1. Form PCT/IB/308
2. Return Postcard
3. Conditional Petition to Revive

531 Rec'd PCT/PTO 23 JAN 2002

U.S.APPLICATION NO 10070169	INTERNATIONAL APPLICATION NO. PCT/DE00/02191	ATTORNEYS DOCKET NUMBER 19075.0

17. The following fees are submitted:

	CALCULATIONS PTO USC Only	
BASIC NATIONAL FEE (37 CFR 1.492 (a) (1)-(5)):		
Search Report has been prepared by the EPO or JPO.....$ 890.00		
International preliminary examination fee paid to USPTO $710.00		
No international preliminary examination fee paid to USPTO but international search fee paid to USPTO.....$740.00		
Neither international preliminary examination fee nor international search fee paid to USPTO.....$1040.00		
International preliminary examination fee paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4).....$100.00		
ENTER APPROPRIATE BASIC FEE AMOUNT =	$ 890	
Surcharge of $130.00 for furnishing the oath or declaration later than ___20 ___30 months from the earliest claimed priority date (37 CFR 1.492(e)	$	

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	23 - 20 =	3	X $ 18.00	$ 54	
Independent claims	1 - 3 =	0	X $ 84.00	$	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ $ 280	$	
TOTAL OF ABOVE CALCULATIONS			=	$ 944	
Reduction by 1/2 for filing by small entity, if applicable.					
SUBTOTAL			=	$ 944	
Processing fee of $130.00 for furnishing the English translation later than ___ 20 ___30 months from the earliest claimed priority date			+ 130		
TOTAL NATIONAL FEE			=	$ 944	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). $40.00 per property				$ 40	
TOTAL FEES ENCLOSED			=	$ 984	
				Amount to be: refunded	$
				charged	$

a. ___ A check in the amount of $ _____ to cover the above fees is enclosed.

b. X Please charge my Deposit Account No. 50-0698 in the amount of $ 984 to cover the above fees.

c. X The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 50-0698. A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b) must be filed and granted to restore the application to pending status.

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SIGNATURE:

Dr. Paul J. Vincent
NAME

37,461
REGISTRATION NUMBER

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	BIGUS, Hans-Jürgen et al.	) Examiner:
PCT Application No.:	PCT/DE00/02191	) unknown
PCT Filing Date:	June 29, 2000	) Art Unit:
For:	USE OF ADHESIVE TAPE FOR HANDLING, TRANSPORTING AND STORING CAPILLARIES AND DISPENSER FOR INDIVIDUAL CAPILLARIES ON THAT ADHESIVE TAPE	) unknown

Docket No.: 19075.0

Assistant Commissioner for Patents

Washington, DC 20231

U.S.A.

PRELIMINARY AMENDMENT

Dear Sir:

Please enter this amendment prior to calculation of the filing fees. This amendment is based on the translation of the application **as amended on July 09, 2001**.

IN THE SPECIFICATION:

On page 1, insert as a title prior to the first paragraph -- BACKGROUND OF THE INVENTION --.

On page 3, insert as a title prior to the third paragraph -- SUMMARY OF THE INVENTION --.

On page 10 insert as a title prior to the brief description of the drawings --

BRIEF DESCRIPTION OF THE DRAWING --.

On page 10 insert as a title following the brief description of the drawing --

DESCRIPTION OF THE PREFERRED EMBODIMENT --.

On page 14, line 1, replace as a title "Claims" with -- WE CLAIM: --.

IN THE CLAIMS:

Please delete **PCT amended claims 1 - 23** without prejudice and enter new claims 24 - 46 as indicated below:

24. A method for using at least one adhesive tape as means for handling, transporting and storing a plurality of capillaries, the method comprising the step of:

introducing the capillaries, in substantially parallel alignment and at separations less than their diameters, onto an endless adhesive tape extending substantially perpendicular to longitudinal axes of the capillaries to hold the capillaries at a portion of their outer surface, a width of the adhesive tape being smaller than half a length of the capillaries.

25. The use of adhesive tape of claim 24, wherein the adhesive tape is coated with a contact adhesive.

26. The use of adhesive tape of claim 24, wherein the adhesive tape is a sheet.

27. The use of adhesive tape of claim 24, wherein said width of the adhesive tape corresponds approximately to a third of said length of the capillaries.

28. The use of adhesive tape of claim 24, wherein the capillaries abut one another.

29. The use of adhesive tape of claim 24, wherein a central longitudinal region of the capillaries is disposed on the adhesive tape with the capillaries projecting past the adhesive tape on both sides thereof.

30. The use of adhesive tape of claim 24, wherein at least two adhesive tapes are provided at a separation from one another with ends of the capillaries projecting past outer edges of the at least two adhesive tapes.

31. The use of adhesive tape of claim 24, wherein the capillaries are wound, together with the adhesive tape, about an axle and into a roll.

32. The use of adhesive tape of claim 24, wherein at least one end of the adhesive tape comprises an adhesive-free removal tab.

33. The use of adhesive tape of claim 24, wherein the adhesive tape is provided with at least one of a label and an imprint for identifying the capillaries.

34. The use of adhesive tape of claim 24, wherein the capillaries have a storage capacity which is less than 500μl.

35. The use of adhesive tape of claim 34, wherein said storage capacity of the capillaries is less than 100μl.

36. The use of adhesive tape of claim 35, wherein said storage capacity of the capillaries is less than 1μl.

37. A dispenser for individual capillaries on an adhesive tape used in accordance with claim 24, the dispenser comprising:

means defining at least one substantially U-shaped receptacle for the capillaries, said U-shaped receptacle having U-legs separated by at least said length of the capillaries to guide ends of the capillaries; and

at least one upwardly disposed guide member, said guide member disposed at a separation from a bottom part of said U-shaped receptacle, said separation approximately corresponding to a diameter of the capillaries, wherein said U-shaped receptacle and said guide member cooperate to define a slotted guide fashioned between said bottom of said U-shaped receptacle and said guide member as an abutment for the capillaries into which the capillaries and adhesive tape can be introduced, said slotted guide having an opening for access to the adhesive tape and a dispensing location for the capillaries disposed opposite an introductory location for the capillaries and adhesive tape, wherein the adhesive tape can be removed from the capillaries while they are supported in said slotted guide.

38. The dispenser of claim 37, wherein said at least one guide member comprises a first guide element and a second guide element, said first and said second guide elements disposed, facing each other, at said U-shaped legs of said U-shaped receptacle, substantially symmetrically and at a separation with respect to one another to define said opening in said slotted guide for removing the adhesive tape, wherein the adhesive tape is disposed on a central longitudinal region of the capillaries.

39. The dispenser of claim 37, wherein said at least one guide member comprises a central guiding element disposed at a separation from said U-shaped legs of said U-shaped receptacle to define a free space between each of its longitudinal edges and a respective U-shaped leg for removing two adhesive tapes disposed on the capillaries at a separation from each other.

40. The dispenser of claim 37, further comprising a slider cooperating with said slotted guide to resiliently urge the capillaries in a direction towards said dispensing location.

41. The dispenser of 40, further comprising means, disposed at an end of said U-shaped receptacle facing away from said dispensing location, cooperating with said slider to

arrest said slider for loading the capillaries into said slotted guide.

42. The dispenser of claim 40, wherein said bottom part of said U-shaped receptacle defines a longitudinal slot, wherein said slider comprises a guiding pin disposed in said longitudinal slot, a helical spring borne on said guiding pin, and a carriage cooperating with said guiding pin and said helical spring.

43. The dispenser of claim 37, further comprising means for winding and unwinding the capillaries with the adhesive tape about an axle, said winding and unwinding means having a helical spring acting on said axle, for loading into said slotted guide.

44. The dispenser of claim 37, wherein said dispensing location is structured for removal of the capillaries from the dispenser in axial directions thereof.

45. The dispenser of claim 44, wherein said dispensing location has at least one discharge opening which is disposed at a level of the capillaries and which penetrates through at least one of said U-shaped legs of said U-shaped receptacle.

46. The dispenser of claim 45, wherein a diameter of said discharge opening corresponds approximately to a diameter of the capillaries.

REMARKS

The amendments have been taken to adapt this application to United States practice. No new matter has been added.

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Translation of PCT/DE00/02191 as amended on July 9, 2001

Use of Adhesive Tape for Handling, Transporting and Storing Capillaries and Dispenser for Individual Capillaries on That Adhesive Tape.

The invention concerns handling, transport and storing of a plurality of capillaries as well as a dispenser of individual capillaries.

Capillaries, in particular microcapillaries are used for a plurality of chemical, biological, biochemical or medical experiments, such as chemical analyses, syntheses, sample preparations, biological tests, blood tests or the like. They consist of an inert material, preferably of glass, and are produced from endless capillary tubes by cutting to length. They are mostly cylindrical, in particular circular cylindrical and the capillary tube can be open at both ends or be closed at one end like a test tube. In the latter case, they can be used as micro-reaction containers and optionally also be coated at the inside with a reactive material, e.g. a catalyst and/or have a flared flange in the region of the fill hole to be closed by a flared cap. Capillary tubes which are open at both ends can also be coated with chromatographic or biologically active sorbents. Also known are capillaries with two closed ends which can be optionally opened via

breaking points. The invention concerns such capillaries and micro-reaction containers.

Capillaries are difficult to handle, in particular due to their small size and fragility, both during manual and automated operation for packing, transporting and storing and also utilization by the user. The capillaries which are cut from the endless capillary tube have been conventionally packed in loose bundles. Transport and storage of such loose bundles can lead to breakage and corresponding injuries. The removal from the bundle and positioning of the capillaries is cumbersome and inconvenient, in particular for containers which are closed at one end and must be disposed with the filling hole facing upwards. Automated removal, sorting and positioning is also problematic.

Insertion of the capillaries into corrugated supports or into punched supports of cardboard has been proposed. This is also inconvenient and unsuitable in particular for very fine microcapillaries having a storage capacity of less than several μ1. One has also attempted to detachably interconnect capillaries by coating them with resins, lacquers or the like and by gluing. These efforts do not produce satisfactory results, since the coating sticks to the capillaries and is difficult to remove.

US 4 960 566 discloses a chemical reaction or measuring device to which capillaries, serving as reaction vessels, can be sequentially fed by means of an endless carrier band. The

capillaries are disposed in parallel and at equal separations on the carrier band by placing them in slots disposed on the upper run of the endless band, in parallel and extending transverse to the direction of travel of the carrier band. In one embodiment, the capillaries are permanently glued to a support band made from paper and plastic.

It is the underlying purpose of the invention to propose means for simplified handling of capillaries to protect them from breakage, in particular, during transport and storage thereof. The invention is also directed to a dispenser for individual capillaries from those means.

The first part of this task is achieved in accordance with the invention through use of at least one adhesive tape as means for handling, transporting and storing a plurality of capillaries, wherein the capillaries are introduced, in substantially parallel alignment and at separations less than their diameters, onto an endless adhesive tape extending substantially perpendicular to their longitudinal axes to be held thereby at a portion of their outer surfaces, the width of the adhesive tape being smaller than half the length of the capillaries.

The inventive adhesive tape facilitates fixing, simultaneous orientation and also dispensing of the capillaries by removing the adhesive tape from the capillaries by exercising a small tensile force. The adhesive tape is preferably connected to only a small surface area of the capillaries

through substantially tangential attachment of parallel capillaries and extends through less than half the length of the capillaries. When the adhesive tape is removed, only small tensile forces act on the capillaries and even very fine capillaries having a storage capacity of a few μl do not break. The tight, parallel arrangement of all capillaries largely protects them from premature breaking during packing, storing and transport. The protection against fracture is larger the tighter the arrangement of the capillaries. Only little packing material is required since the capillaries, arranged in parallel and preferably very close to one another, require less space than in a loose bunch. The packing volume can be further reduced and the protection against fracture further increased when the adhesive tape and the capillaries are wound together into a roll or disposed and packed in parallel layers. Their orientation and positioning also simplifies handling by the user. If the capillaries are closed at one end (i.e. micro-reaction containers) their filling holes are preferably oriented in the same direction.

The adhesive tape is preferably coated with a contact adhesive. The contact adhesive can be applied to the tape e.g. as a solution or a dispersion, with the capillaries then being adhesively bonded to the adhesive film and the solvent subsequently evaporated. Such contact adhesives form, within a relatively short time, an adhesive film of sufficient stability for connecting only a small surface area of the capillaries in a substantially tangential manner and

guarantee release of the adhesive tape without affecting the capillaries. The adhesive tape is preferably formed as a sheet, e.g. a thermo-plastic sheet.

As stated above, the width of the adhesive tape is smaller than half the length of the capillaries and preferably approximately one third of the length of the capillaries. This limits the adhesive strength to a required degree for sufficient adhesion to the tape.

As mentioned above, the capillaries are densely disposed on the adhesive tape, with their separations being smaller than their diameter. They can also abut one another. In this latter case, preferably one or more adhesive tapes are provided on only one side of the parallel capillaries to permit winding about a winding axis at the adhesive tape side.

The central longitudinal region of the capillaries is preferably disposed on one single adhesive tape and projects past both sides of the tape. Alternatively, two or more adhesive tapes can be provided at a separation from one another, with the ends of the capillaries projecting past the outer edges of the adhesive tapes.

To facilitate removal, the adhesive tape has an adhesive-free removing tab at at least one end. The removal tab of the adhesive tape can either be uncoated or the adhesive film can be laminated in the region of the removal tab. The adhesive

tape and/or the removal tab can comprise a label, an imprint or the like for identifying the capillaries to indicate e.g. the length, diameter, volume and material.

The invention is fundamentally suited for capillaries of any type, but preferably for capillaries having a small storage capacity of between 0.2 and 500μl or a capillary diameter of less than 3mm.

The invention also concerns a dispenser for individual capillaries on an adhesive tape of the above mentioned kind. In accordance with the invention, a dispenser of this kind has at least one substantially U-shaped recepticle for the capillaries whose U-legs are separated by at least the length of the capillaries to guide the ends of the capillaries and with at least one upwardly disposed guide member having a separation from the bottom part of the U-shaped recepticle corresponding approximately to the diameter of the capillary, wherein a slotted guide is fashioned between the bottom of the U-shaped recepticle and the guide member as an abutment for the capillaries which leaves the adhesive tape accessible, into which the capillaries and adhesive tape can be introduced, and which has a dispensing location for the capillaries opposite that introductory location, wherein the adhesive tape can be removed from the capillaries while they are supported in the slotted guide.

After manual removal of the adhesive tape from the capillaries, the capillaries are maintained in parallel

arrangement for separation and delivery. Individual capillaries can be removed from the dispenser at the dispensing location with constant predetermined alignment and orientation. The dispenser provides safe and regulated supply of the capillaries and provides protection from mechanical loads. The slotted guidance must be designed such that the capillaries have sufficient support to reliably prevent breakage thereof when removing the adhesive tape.

US 3 173 728 A discloses a dispenser for swabs which are disposed at a middle section thereof on one side of a support strip. A second corrugated strip is also preferably provided to accept the swabs in the corrugations for holding therein by the oppositely disposed support strip. The corrugated strip is guided inside the dispenser using deflecting rollers with the support strip projecting out of the dispenser through a removal opening to dispense the swabs by pulling on the support strip and subsequent release of the swabs therefrom. Individual separation of capillaries is not envisioned and the removal of the swabs is problematic, since these must first be withdrawn from the dispenser and, following withdrawal, separated from the support strip. Moreover, the guided slot of the dispenser in accordance with the invention for individual capillaries permits removal of the adhesive tape prior to dispensing the capillaries and directly after loading the dispenser therewith, so that e.g. the large number of capillaries needed for chemical analysis and synthesis can be rapidly and reliably dispensed.

The arrangement of the guiding member with respect to the U-shaped receptacle depends on the arrangement of the adhesive tape(s) with respect to the longitudinal axis of the capillaries. Towards this end, in a preferred embodiment, two guiding members are provided which face one another and are disposed substantially symmetrically and at a respective U-shaped leg of the receptacle to define an intermediate space for removing the adhesive tape disposed in the central longitudinal region of the capillaries. Both ends of the capillaries are held in the receptacle by the guiding members and the adhesive tape can be removed between the guiding members. The width of the guiding members corresponds preferably to e.g. a third of the length of the capillaries and the width of the adhesive tape disposed at the central longitudinal region of the capillaries corresponds to approximately also a third of the length of the micro-reaction containers.

In a modified embodiment, a central guiding member is disposed at a separation from the U-shaped legs of the receptacle which forms one free space between each of its longitudinal edges and a respective U-shaped leg of the receptacle for removing two adhesive tapes which are disposed at a separation from one another.

A slider is preferably provided which is guided in the slotted guidance and elastically acts on the capillaries in the direction of the dispensing location to constantly load the capillaries in the direction of the dispensing location.

For supplying the dispenser, the slider can be arrested e.g. preferably at the end of the U-shaped bar of the receptacle facing away from the dispensing location. The slider can be connected to a guiding pin which is provided in a slotted hole formed in the U-shaped leg of the receptacle and accommodates a helical spring disposed between the slider and the end of the slotted hole facing away from the dispensing location.

In accordance with another embodiment, the capillaries are wound into a roll and are loaded into and within the slotted guidance in dependence on the amount of capillaries to be dispensed and also using a helical spring cooperating with the winding axle.

In a preferred embodiment, the capillaries can be removed from the dispenser in their axial direction at the dispensing location. In this case, the dispensing location can have at least one delivery opening disposed at the level of the capillaries and penetrating through at least one of the U-shaped legs of the receptacle, whose diameter is preferably approximately equal to or slightly larger than the diameter of the capillaries.

Embodiments of the invention are described in more detail below with reference to the drawings.

Fig. 1 shows an adhesive tape having an adhesive tape introduced at the longitudinal middle region of the capillaries;

Fig. 2 shows a perspective sectional view of a dispenser for dispensing capillaries from the device in accordance with Fig. 1;

Fig. 3 shows a perspective detailed view of the dispensing location of the dispenser in accordance with Fig. 2; and

Fig. 4 shows a front view of a further embodiment of a dispenser.

Fig. 1 shows an embodiment in accordance with the invention for use of an adhesive tape 2 to handle, transport and store capillaries 1. The capillaries 1 are arranged in parallel on which extends substantially perpendicular to their longitudinal axes and are thereby held along a portion of their surface area. The adhesive tape 2 is coated with a contact adhesive. The capillaries 1 are disposed close to one another such that the separation a is considerably smaller than the diameter D of the capillaries 1. The diameter D of the capillaries 1 can e.g. be approximately 0.5mm and the length L approximately 3cm. In the present embodiment, the width d of the adhesive tape 2 corresponds to approximately 30% of the length L such that the adhesive tape 2 provides sufficient force for holding the capillaries 1 and permits

easy removal of the adhesive tape 2. The adhesive tape 2 has a removal tab 2a at at least one end thereof and can be provided in the region of the capillaries 1 and/or the region of the removal tab 2a with labels, imprints 3 or the like for identifying the capillaries 1. The imprint 3 shown indicates e.g. the diameter D and the filling volume V of the capillaries 1. The unit which consists of the adhesive tape 2 and the capillaries can be wound into a roll.

Fig. 2 shows a dispenser for delivering the capillaries 1. It has a slotted guidance 5 into which the capillaries 1, held by the adhesive tape 2, can be introduced. The slotted guidance 5 has a substantially U-shaped receptacle 6 with a U-shaped bar 8 forming a supporting surface for the capillaries 1 and U-shaped legs 7 guiding the ends of the capillaries. The separation between the U-shaped legs 7 therefore corresponds to approximately the length L of the capillaries 1. Two mutually opposed and symmetrically disposed guiding members 9 are each located at a respective U-shaped leg 7 and have a separation from the U-shaped bar 8 of the receptacle 6 corresponding substantially to the diameter D of the capillaries 1. The guiding members 9 are fastened to the U-shaped legs 7 e.g. using rivets 10 and are disposed at a separation b from one another. The separation b corresponds approximately to the width d of the adhesive tape 2 disposed on the central longitudinal region of the capillaries 1. After the capillaries 1 have been inserted into the slotted guidance 5, the adhesive tape 2 can be removed along the guiding members 9 in the direction of the

arrow 14. The slotted guidance 5 comprising the receptacle 8 and the guiding members 9 can also be designed as one single C-shaped part.

An elastically supported slider 20 is guided in the slotted guidance 5 which constantly loads the capillaries 1 in the direction of a dispensing location of the dispenser (arrow 13). To facilitate supply of capillaries 1 to the slotted guidance 5, the slider 20 can be arrested at the end 6a of the receptacle 6 facing away from the dispensing location. Towards this end, a tab 22 is punched out of the slider, which consists e.g. of sheet metal, and engages in the end 6a of the receptacle 6. The slider 20 is also provided with a handling means having the shape of a nose 23 which is bent upwards. The elastic support for the slider 20 is realized in the embodiment shown in that the slider 20 has a tab 21 which projects substantially perpendicularly downward and has a bore 24 which is penetrated by a guiding pin 26 disposed in a slot in the U-shaped bar 8 of the receptacle 6. A helical spring 27 is disposed on the guiding pin 26 between the tab 21 and the end of the slot 25a facing away from the dispensing location.

As seen in Fig. 3, the capillaries 1, loaded by the helical spring 27 in the direction of the dispensing location 15, are held by pins 11 at a front end 12 of the receptacle 6. They can be removed from the dispenser at this position via an opening 16 having a diameter s which is larger than the diameter D of the capillaries 1. Alternatively, the

capillaries 1 can be removed from the dispenser on the end face 12, e.g. by retracting the pins 11.

The dispenser of Fig. 4 has a central guiding member 9 which is disposed at separations c and d, respectively, from the U-shaped legs 7 of the receptacle 6 to define one free space between each of its longitudinal edges 9a,9b and the respective U-shaped leg 7 for removing two adhesive tapes (not shown) which are disposed at a separation from one another on the capillaries 1. The width of the adhesive tapes (not shown) approximately corresponds to the distance e, f between the central guiding member 9 and the U-shaped legs 7 of the receptacle 6. The separations e, f are preferably equal.

The dispenser improves the handling of the capillaries 1, since they are stored such that they do not break and can be removed from the dispenser with precise and constant orientation.

Claims

1. Use of at least one adhesive tape as means for handling, transporting and storing a plurality of capillaries, wherein the capillaries (1) are introduced, in substantially parallel alignment and at separations less than their diameters, onto an endless adhesive tape (2) extending substantially perpendicular to their longitudinal axes to be held thereby at a portion of their outer surface, the width (d) of the adhesive tape (2) being smaller than half the length (L) of the capillaries (1).

2. Use of adhesive tape according to claim 1, characterized in that the adhesive tape (2) is coated with a contact adhesive.

3. Use of adhesive tape according to claim 1 or 2, characterized in that the adhesive tape (2) is a sheet.

4. Use of adhesive tape any one of the claims 1 to 3, characterized in that the width (d) of the adhesive tape (2) corresponds approximately to a third of the length (L) of the capillaries (1).

5. Use of adhesive tape according to one of the claims 1 to 4, characterized in that the capillaries (1) abut one another.

6. Use of adhesive tape according to any one of the claims 1 through 5, characterized in that the central longitudinal region of the capillaries (1) is disposed on an adhesive tape (2), with the capillaries (1) projecting past same on both sides.

7. Use of adhesive tape according to any one of the claims 1 through 5, characterized in that two or more adhesive tapes are provided at a separation from one another and the ends of the capillaries (1) project past the outer edges of the adhesive tapes.

8. Use of adhesive tape according to any one of the claims 1 through 7, characterized in that the capillaries (1) are wound, with the adhesive tape (2), about an axle into a roll.

9. Use of adhesive tape according to any one of the claims 1 through 8, characterized in that at least one end of the adhesive tape (2) comprises an adhesive-free removal tab (2a).

10. Use of adhesive tape according to any one of the claims 1 through 9, characterized in that the adhesive tape (2) is provided with a label, imprint (3) or the like for identifying the capillaries (1).

11. Use of adhesive tape according to any one of the claims 1 through 10, characterized in that the storage capacity of the capillaries (1) is smaller than 500μl.

12. Use of adhesive tape according to claim 11, characterized in that the storage capacity of the capillaries (1) is smaller than 100μl.

13. Use of adhesive tape according to claims 11 of 12, characterized in that the storage capacity of the capillaries is smaller than 1μl.

14. A dispenser for individual capillaries (1) on an adhesive tape (2) according to any one of the claims 1 through 13, with at least one substantially U-shaped recepticle (6) for the capillaries (1) whose U-legs (7) are separated by at least the length (L) of the capillaries (1) to guide the ends of the capillaries and with at least one upwardly disposed guide member (9) having a separation (h) from the bottom part of the U-shaped recepticle (8) corresponding approximately to the diameter (d) of the capillaries (1), wherein a slotted guide (5) is fashioned between the bottom of the U-shaped recepticle (8) and the guide member (g) as an abutment (12) for the capillaries (1) which leaves the adhesive tape (1) accessible and into which the capillaries (1) and adhesive tape (1) can be introduced, and which has a dispensing location (15) for the capillaries (1) opposite that introductory location, wherein the adhesive tape (2) can be removed from the

capillaries (1) while they are supported in the slotted guide (5).

15. Dispenser according to claim 14, characterized in that two guiding members (9) face one another and are disposed at the U-shaped legs (7) of the receptacle (6) substantially symmetrically and at a separation from one another to define an intermediate space for removing the adhesive tape (2) disposed on the central longitudinal region of the capillaries (1).

16. Dispenser according to claim 15, characterized in that a central guiding member (9) is provided at a separation (e, f) from the U-shaped legs (7) of the receptacle (6) to define a free space between each of its longitudinal edges (9a,9b) and a respective U-shaped leg (7) for removing two adhesive tapes disposed on the capillaries (1) at a separation from each other.

17. Dispenser according to any one of the claims 14 through 16, characterized in that a slider (20) is provided which is guided on the slotted guidance (5) and acts elastically on the capillaries (1) in the direction of the dispensing location (15).

18. Dispenser according to claim 17, characterized in that the slider (20) can be arrested at the end (6a) of the receptacle (6) facing away from the dispensing location

(15) for loading the capillaries (1) into the slotted guidance (5).

19. Dispenser according to claim 17 or 18, characterized in that the slider (20) is connected to a guiding pin (26) which is disposed in a slot (25) formed in the U-shaped bar (8) of the receptacle (6) and receives a helical spring (26) disposed between the slider (20) and the end (25a) of the slot (25) facing away from the dispensing location (15).

20. Dispenser according to any one of the claims 14 through 18, characterized in that the capillaries (1) wound with the adhesive tape (2) about an axle, can be unwound by a helical spring acting on the axle, and be loaded into the slotted guidance (5).

21. Dispenser according to any one of the claims 14 through 20, characterized in that the capillaries (1) can be removed from the dispenser at the dispensing location (15) in their axial direction.

22. Dispenser according to claim 21, characterized in that the dispensing location (15) has at least one discharge opening (16) which is disposed at the level of the capillaries (1) and penetrates through at least one of the U-shaped legs (7) of the receptacle (6).

23. Dispenser according to claim 22, characterized in that the diameter (s) of the discharge opening (16) corresponds approximately to the diameter (D) of the capillaries (1).

Abstract

Device for handling, transporting and storing capillaries, method for the production thereof and individual capillary dispenser therefrom.

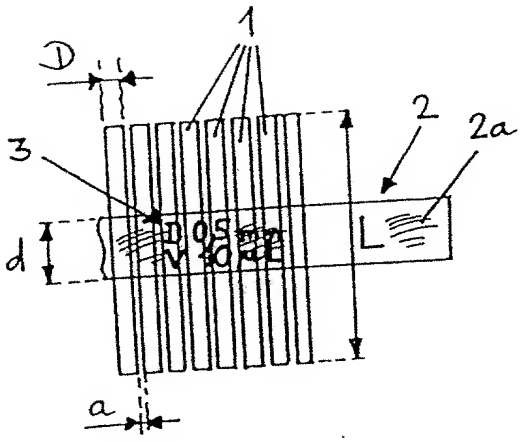

Fig. 1

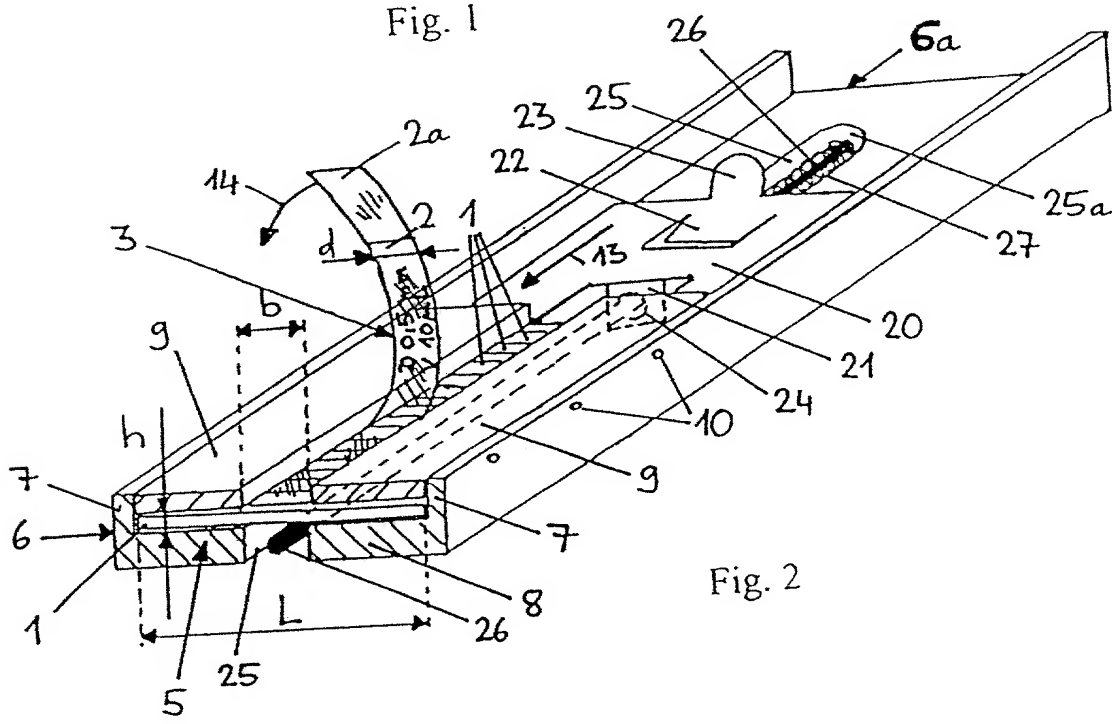

Fig. 2

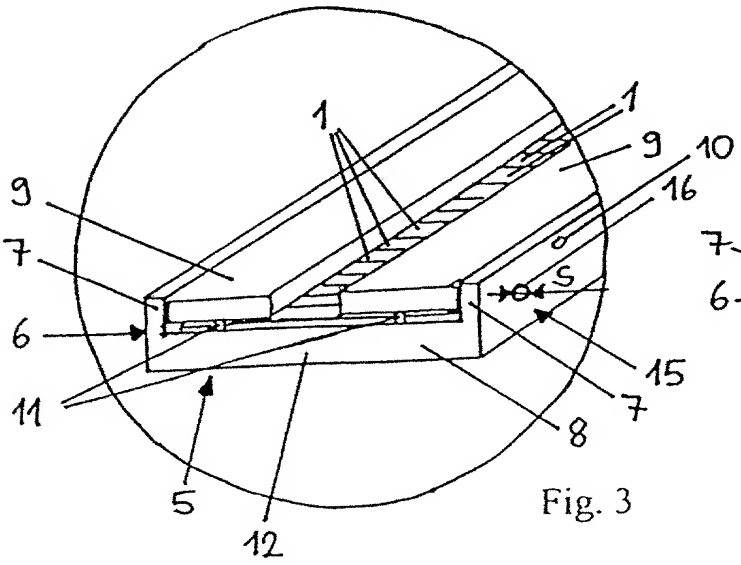

Fig. 3

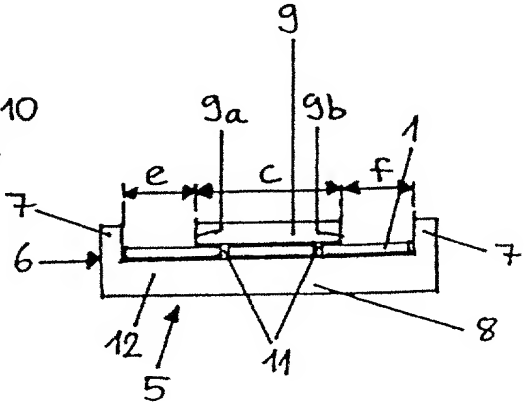

Fig. 4

COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY
(Includes Reference to PCT International Applications)

ATTORNEY DOCKET NUMBER
19075.0

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

Device for handling, transporting and storing capillaries, method for the production thereof and individual capillary dispenser therefrom

the specification of which (check only one item below):

☐ is attached hereto.

☐ was filed as United States application

Serial No. _____

on _____,

and was amended

on _____ (if applicable)

☒ was filed as PCT international application

Number PCT/DE00/02191

on June 29, 2000,

and was amended under PCT Article 19

on _____ (if applicable)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is known to me or other person(s) involved in the preparation or prosecution of this application to be material to the examination of this application and to patentability as defined in Title 37, Code of Federal Regulations, §1.56.

I hereby authorize the U.S. attorney or agent named herein to accept and follow instructions from _____

as to any action taken in the Patent and Trademark Office regarding this application without direct communication between the U.S. attorney or agent and the undersigned. In the event of a change in the persons from whom instructions may be taken, the U.S. attorney or agent named herein will be so notified by the undersigned.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other that the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

PRIOR FOREIGN/PCT APPLICATION(S) AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. 119

COUNTRY (if PCT, indicate "PCT")	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 35 USC 119	
Germany	199 35 634.3	29. July 1999	☒ YES	☐ NO
			☐ YES	☐ NO
			☐ YES	☐ NO
			☐ YES	☐ NO
			☐ YES	☐ NO

Combined Declaration For Patent Application and Power of Attorney (Continued)
(Includes Reference to PCT International Applications)

ATTORNEY DOCKET NUMBER: 19075.0

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) or PCT international application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application:

PRIOR U.S APPLICATIONS OR PCT INTERNATIONAL APPLICATIONS DESIGNATING THE U.S. BENEFIT UNDER 35 U.S.C. 120

U.S. APPLICATIONS		STATUS (Check one)		
U.S. APPLICATION NUMBER	U.S. FILING DATE	PATENTED	PENDING	ABANDONED

PCT APPLICATIONS DESIGNATING THE U.S.

PCT APPLICATION NUMBER	PCT FILING DATE	U.S. SERIAL NUMBERS ASSIGNED (if any)			

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (List name and registration number)

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I hereby declare under penalty of perjury under the laws of the United States of America that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine and imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

SIGNATURE OF INVENTOR 201	SIGNATURE OF INVENTOR 202	SIGNATURE OF INVENTOR 203
DATE: January 21, 2002	DATE: January 21, 2002	DATE: January 21, 2002